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OF THE

ROYAL ASTRONOMICAL SOCIETY.

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WILLIAM HUGGINS, ESQ., F.R.S., President, in the Chair.

Sir David Salomons, B.A. Nat. Sc., Broom Hill, Tunbridge Wells;
John Bagnold Smith, Esq., The Laurels, Chesterfield;
William Thomas Smedley, Esq., 20, Colmore Row, Birmingham; and
Thomas Watson, Esq., J.P., F.R.G.S., 15, York Place, Portman Square;

were balloted for and duly elected Fellows of the Society.

An Instrument for Determining Spherical Triangles by Mechanical Action. By F. C. Penrose, Esq.

Two planes formed of wood or any suitable material are hinged so as to revolve with respect to each other, through an angle of 180°, on a common axis.

One of these planes is bounded by a semicircle, the other by a segment rather exceeding a quadrant, but both to the same radius.

Below this last-mentioned plane, and at right angles to the axis upon which the two planes revolve, is another plane bounded by a semicircle, but cut to a smaller radius, about two-thirds of that of the former. This is hinged so as to fall down like the flap of a fold-up table, for the purpose of rendering the instrument more portable.

The three planes are graduated on their circular edges; the two former into degrees, the latter more particularly into divisions representing hours and minutes.

An arm or radius bar is centred so as to carry a point along the graduated edge of the quadrant, and from this point issues a

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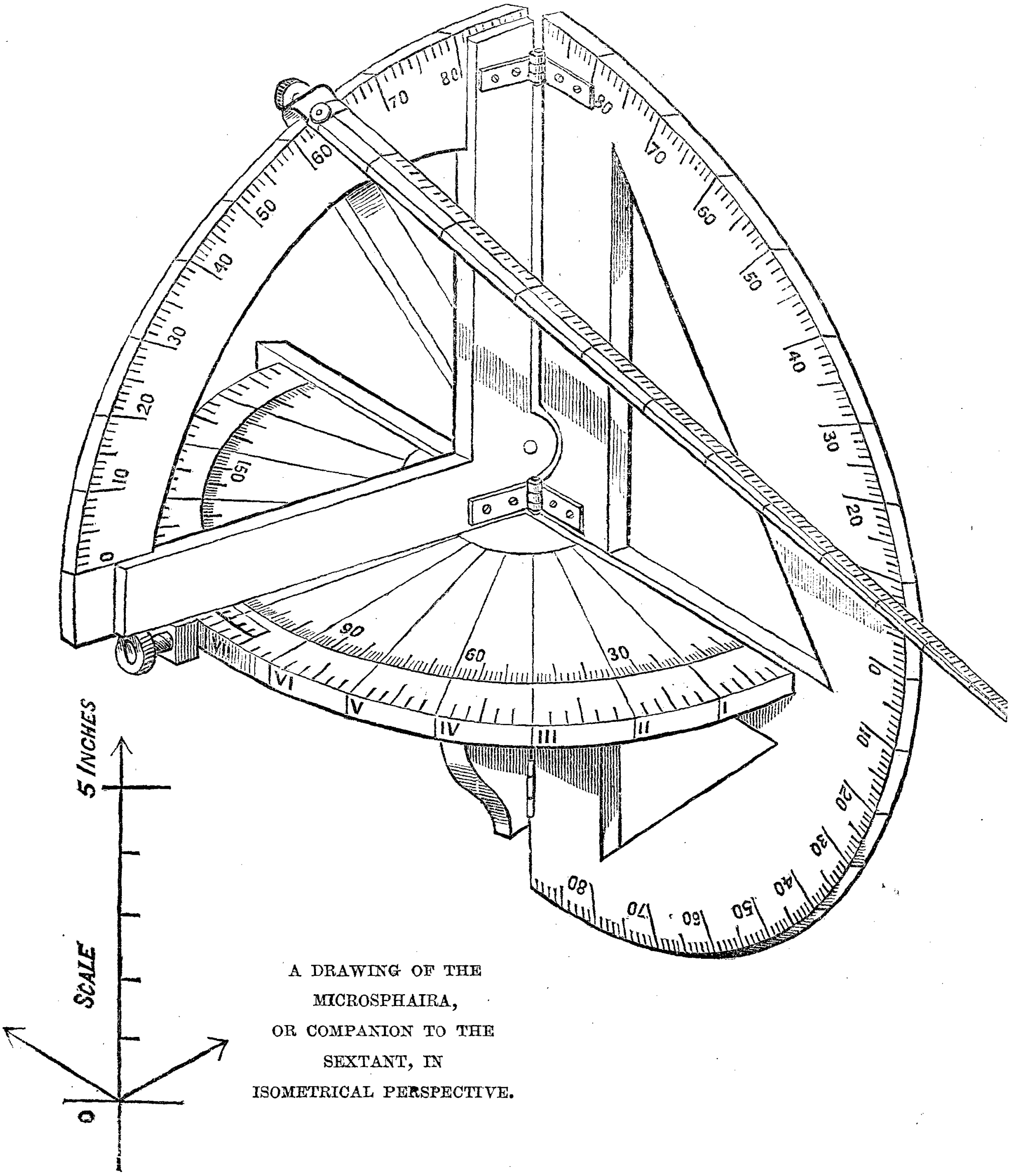
link, free at the other extremity, and graduated with a scale of chords measured from a circle of the larger radius mentioned.

This link, by means of an universal joint at the point first described, is enabled to be placed in any direction, and can thus be applied to any part of the graduated edge of the semicircle first mentioned, namely, that which is hinged upon the same axis as the quadrant. Clamps are placed upon the radius bar, and upon the extremity of the quadrant plane, so that they may be fixed in any position that may be desired.



A DRAWING OF THE
MICROSPHAIRA,
OR COMPANION TO THE
SEXTANT, IN
ISOMETRICAL PERSPECTIVE.

By means of these three graduated arcs and the free link, any ordinary problem in spherical trigonometry can be determined by mere inspection and without calculation: the most usual

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cases in one operation, and others somewhat more complex in two.

For instance, if three sides are given and combined on the instrument, one of the angles will be shewn on the semicircular plane; or if an angle and two sides are given and combined upon the instrument, the third side can be read off upon the free link or upon the semicircle, according to the nature of the problem; but if two sides and an angle are given and an angle is required, or if two angles and a side are given, two operations would be necessary. They can be performed, however, with great rapidity.

The instrument can be used as a useful check to logarithmic computations; and as its accuracy is not inconsiderable [for instance, in a well-made instrument it would determine the hour-angle, or the azimuth from an altitude of the Sun, &c., taken near the prime vertical to about 20 seconds of time or 5′ of arc], it might sometimes stand in the place of logarithmic computations altogether, and be used as the companion to the sextant by navigators and travellers in unexplored regions; and especially so since by far the most accurate purpose to which it can be applied (so far as my experience of it enables me to speak) is in reducing the ordinary Lunar distance observation, by performing on the instrument the operation of "clearing the distance"—for the ratio between the effect of parallax on the measured distance and the parallax in altitude, can be found very readily and to a degree of accuracy not inferior to any other approximate method. The error, for instance, would scarcely ever exceed five seconds of arc; and a few printed tables can be affixed to the blank parts of the instrument to render it, for lunar measures, independent of all books, except the *Nautical Ephemeris*.

Radiant-Points of Shooting Stars. By William F. Denning, Esq., F.M.S.

(*Communicated by R. S. Greg, Esq., F.R.A.S., F.G.S.*)

The following Radiant-Points have been deduced from the observed paths of nearly 900 shooting stars, seen during the last four years at Bristol. The positions (which are chiefly those of the primary meteor-showers) have been ascertained by pencilling the courses on a Cary's 18-inch globe, and prolonging them backwards, the average places of convergence being selected as the approximate areas of radiation. The results were obtained independently of any previously published list; and a later reference to the valuable data of Professor Herschel, Mr. Greg,